

W351

Nov. 10, 1948.

58-161 x W583. m EMS Lac B,

6.

absolute
n.g.

6
+1?

A + + + + + -

X - - - -

6
+ + + + +
-(+)

M
- +

— + + + + + + + +

A + + + + + - + + +

X - - - - -

G + + + + + + + + - + + +

2 →
- + - - - - - - - - - - - -

— + + + + + + - + + +

+ + + + + + + + + + + + + + + +

2
4

(4)
feels!

351

A

+++⑦+++ ++++++ + + + + + + + +

M + - - - - + + + + + + + + +

X
+
?

卷之三

3

A + + + + + + + +

L M G X A

Check TI sensitivity on Gal EMS.

20 Ar+ : All Isotopes

23 Ar - : 1? δ_{cal} +
22 δ_{cal} -
all S; no R.

28-161 : 5

W.583 R

Summaries. 164 total.

Lac + 187

Lac - 27

Note excess of Lac+!

Among 27 Lac- Mal+ Xyl+ Gal- Ar-

Total :

Ar + Gal closely linked.

12 Gal- Ar -

1 Gal- Ar +

0 Gal+ Ar -

151 Gal+ Ar +.

test Ar with Lac.

Lac- Ar - 15

Lac- Ar + 19

Lac+ Ar - 5 (triples?)

Lac+ Ar + 126

However, the distorted recovery of Lac- makes the conclusion dubious.
Suggests that Gal and Ar are very near to ~~V₁~~ V₁. Check directly.

WY77 Lac^R.

W352-

Nov. 10, 1948.

Stockout WY77 in EMB Lac

11/12/48. Pick ~~top~~ 2 papillae to (1). EMB Lac + - cold
p14 to (2) . . . to 5 purifications = W588!

Sub-suppressors

353

Nov. 11, 1948.

Stock out, in glucose, for population

from W252,

1 W 431

2 436

3 437

4 438.

252 stock apparently Glu+. Select
Present stock apparently contains
or contains.

from 0327, Mal -

12/6/48. W-252 received from
Doudoroff. Checks OK as Lac+ Glu-

5 W 441
6 443
7 452 ~~446~~
8 448

Malst

9 447
10 453
11 439
12 440

- (1) 4 Glu+ colonies examined: all +. Store as 353-1. Probably ~~Lac~~ Lac₃ +.
 (2) 1 D +. Not Lac +!

| 353-1. | Glu | Mal | Lac |
|--------|-----|-----|-----|
| 2 | + | | |
| 3 | + | + | - |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |

11/16/48. Restreaks from EMB/She plates above.

N17.

| | | |
|------------------------------|---|------------------------------------|
| 1. many +. | Pick to EMB Lac individually for possible <u>Ale + Lac</u> - types. | |
| 2. papillae in wood streaks. | Restreaks. | A few +. As 1. |
| 3. " " | " | pap. hold. |
| 4. all - | " | (pap - hold |
| 5. " | " | - hold. |
| 6. Several +. | As 1. ^(ny) Active lac-. S.O. ① 20353-6. | |
| 7. papillae | Restreaks | +,- do 1. |
| 8. all - | " | Same slow + hold. |
| 9. pap. | " | +,- As 1 |
| 10. pap. | " | do. |
| 11. pap. | " | Same slow + hold . As 1 |
| 12. Same + cols, but | " | As 1. |

① → 11 tested. 2-; 2+ and -; 7+. Pick 1- and 1+ for purification

11/25. Raise these cultures up again which had been held for a week

2: 7 all Lac - (should be tested on Mal).

11: 8 all Lac - (" " " ")

1b Lac + ~~the +~~
c Lac - the slow.

9. Glu++ and the slow. Test on Mal

10. all the's

6+7 all - (7 slow +?)

11/30/48.

- 9. 3 colonies Glu++ \rightarrow Mal++ } Purify 1 each. Rep. as 353-9
 2 cols. Glu± \rightarrow Mal- . \rightarrow Glu±. T.O.
- 2 $\frac{3}{2}$ Lac++ } Dead. $\frac{\text{Glu}++}{\text{Glu}\pm}$ Rep. as 353-2
 $\frac{1}{2}$ Lac- T.O.
- 3 5. all Lac- ① Glu±. T.O.
- 4. 11 all Lac- ①. Glu±. T.O.
- 5 5 ~~Mal+~~ }
 1 Mal++ }
 2 Mal- } each. Glu±. T.O.
- 8 6 Mal- ① # Glu±. T.O.
- 10 4 Mal- ① Glu±. T.O.
- 12 8 Lac- ① Rep. as 353-12
- 11. Lac- Glu±. T.O.

11/11/48.

83 plates T₂ } 8-161 Hanovia UV lamps 7 sec.
85 EMB } glucose. Ca. 100 / plate $\div 16,800$ tests.
1 each from T₂ and EMB.
W593 W594

Udulr = T₁, Lac, Mal, Xyl.

11/12/48.

To a base of peptone 10

| | | |
|---------------------------------|-----|---------|
| Fe ammonium citrate | .5 | / liter |
| K ₂ HPO ₄ | 1.0 | |
| Agar | 15 | |

Prepare plates with following supplements (/liter).

K-12

SW13.

1. Na thiosulfate .8 g

2. -

3. Cysteine 100 mg

4. " + Nats

5. P2Case 10g

6. " + Nats

In 18 hours, all grew quite well, but none do. 72 hours
were discolored.Kligler's Pb-acetate agar also tried. nothing gave sharp
reaction in K-12 or SW13.

11/9/48.

S.O. stock suspensions on EMS Glu.

PH Pick 4 col. each to water. S.O. Lac (trygl EMB.)

1 2 3 4

H1 - - ++ -

H22 - - - -

H52 $\pm v$ $\pm v$ $\pm v$ ~~$\pm v$~~ - OK 1-3

H62 - - - -

H72 $\pm v$ - - -H85 $\pm v$ $\pm v$ $\pm v$ $\pm v$

H93 v v v v

These critical strains should be carried by repeated single-colony transfer.

(H52/1; H72/1; H85/1 and H93/1) on EMS Lac. and
 old stocks of the other strains here. Not recovered from suspensions.
 Detect single lac+ colonies, and s.o. concomitantly on E43.
 Recover \rightarrow from EMB to EMS Lac

11/16/48

H1. 8 tests. 1-4, 5, 8 OK.

H22 8 tests 6 best V, others OK.

H52. 4 tests 1, 4 OK.

H62. 8 tests 1-4, 5, 8 very good 6, 7 OK.

H72. from GluEMBS. 2 test both + -

H85. on xylose EMB 2 tests both v.g. (on lac EMBS. Need ~~#~~)

H93 2 tests both OK. on lac EMBS near -.

H-72 needs be recovered! OK ✓ . 11/18.

11/12/48

.2ml serum /10ml NaP 7.5 4/50. .001ml 319A.

| Serum | Di | D _f | D _i ^{CO₂} | Δ |
|----------|-----|----------------|--|------|
| 1. - | 007 | 190 | 190 | 190 |
| 2. 11/11 | 580 | 630 | 522 | 108? |
| 3. 11/6 | 437 | 546 | 397 | 149 |
| 4. 11/4. | 350 | 481 | 315 | 166 |

See L.S. tree
for definition of
these sera.

Streak out individual mosaic colonies from each heterozygote to classify with respect to Lac_1 ; Lac_2 . Also test individual colonies, as seen, on Bengal in .5 ml tubes.

| Bugal. | S.O. on LacEMB. |
|----------|----------------------------|
| 1 | + |
| 2 | - |
| 3 not H. | |
| 4 | - |
| 5 | - , V
- , (v) |
| 6 | - , V
- , V, + |
| 7 | - , V
- , (+) |
| 8 | - , V |
| 9 | - , + |
| 10 | - , + |
| 11 | - , V |
| 12 | - , V |
| 13 | - , + , (V)
- , + , (v) |
| 14 | - , + , (V) |
| 15 | - , V |
| 16 | - , + , V |
| 17 | - , V |
| 18 | - , + |
| 19 | - , V
- , V, + |
| 20 | - , V
- , V, + |
| 21 | - , (V) + |

W477 +
W45 -
W583 +

Study, in detail, 1-4. Pick ⁸ colonies and test on Bengal.

- ①. 1-3, 5-8 are Lac /Bugal + #4 is Bugal -.
- ②. 1-3, 5, 6, 8 are Bugal; 4, 7 Bugal +
- ③. 1-4, 7 are Bugal -; 5, 6, 8 are +. streak each of these out again and test on LacEMB.
Isolate and test for cross tests.

Sugarcane from Loc. ±
Loc₂ ±

December 2, 1948.

H-135. 8 colonies nutritional test:

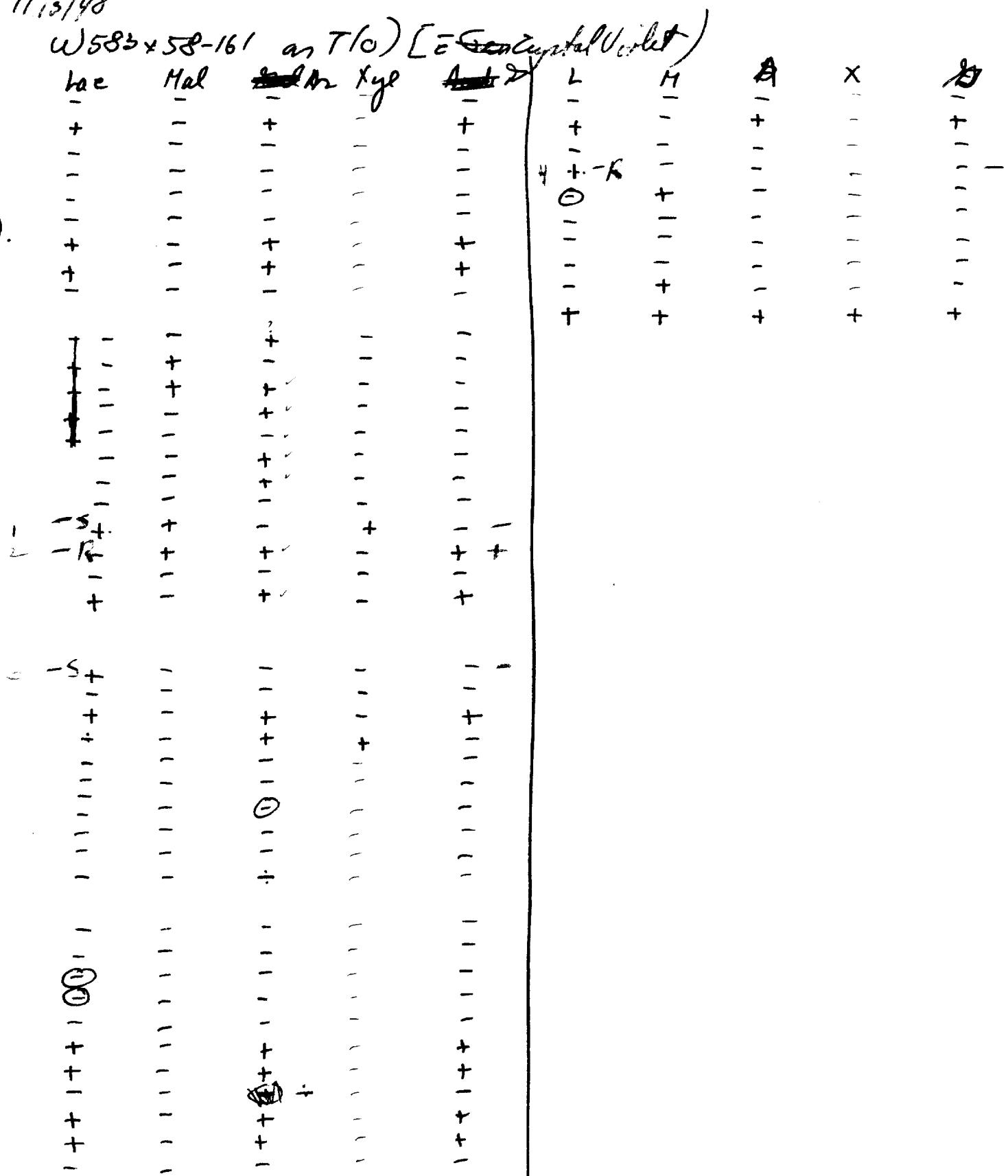
| Bugal. | Nutri. |
|--------|--------|
| 1 | TB, |
| 2 | M |
| 3 | M |
| 4 | M |
| 5 | ++ |
| 6 | ++ |
| 7 | M |
| 8 | M |

12/6. Originals, in EMS Lac., of these cultures
cannot be found.

Map sugar factors.

11/5/48

W583 x 58-161 as T(0) [=~~Encrystall Violet~~]

LacMal~~Am~~ Xyl~~2D~~LH~~A~~X~~D~~I(1)
from T(0).

Lac- Gal+ 6

Lac+ Gal⁻ 0.

This is the right order.

By Lac^{ca^{4u}} Gal V.

1/14/49
This class is
missing because Gal is
sensitive to Lac+.

(2)
T(BJ)

| | | | | | |
|----|---|---|---|---|---|
| | L | M | G | X | A |
| 1 | - | - | - | - | - |
| 2 | - | - | - | - | - |
| 3 | - | - | - | - | - |
| 4 | - | - | - | - | - |
| 5 | - | - | - | - | - |
| 6 | - | - | - | - | - |
| 7 | - | - | - | - | - |
| 8 | - | - | - | - | - |
| 9 | - | - | - | - | - |
| 10 | - | - | - | - | - |
| 11 | - | - | - | - | - |
| 12 | - | - | - | - | - |

Rel and trab are clearly linked to Loc, but ~~do~~ relative positions are not clearly established. The critical recombinants, i.e. G ± L = should be rechecked for classification
More below average.

Additional tests (sugars omitted).

(4)

T(B.)

A v. difficult to score since, usually +.

65.

T(B₁)

A v. difficult locus, with almost +
close linkage of $t+G$ to L is
shown. Order of $t+G$ not established.

Pick colonies to Xyl OHS(B₁) for scoring of this character alone.

2.8%

| | Xyl+ | Xyl- | Σ | |
|------------------|-----------|------------|------------|--------|
| - B ₁ | 4 | 95 | 99 | |
| T(0) | 30 | 73 | 103 | |
| | 37 | 82 | 89 | |
| | <u>41</u> | <u>250</u> | <u>291</u> | |
| | | | | 14% |
| | | | | = 5.8% |

! omitted :

| | | |
|---|-----------|------------|
| Y | 95 | 91 |
| 7 | 82 | 89 |
| | <u>11</u> | <u>177</u> |

188

| T(B ₁) | 3 | 81 | 84 | |
|--------------------|-----------|-------------|------------|-------|
| | 2 | 75 | 77 | |
| | 3 | 111 | 114 | |
| | T | 118 | 120 | |
| | | 101 | 102 | |
| | <u>11</u> | <u>486.</u> | <u>497</u> | |
| | | | | 3.3%. |

There are definitely a higher number of Xyl+ among the B₁+ than among the B₁-.

| B ₁ - | Xyl- BM+ | TL- |
|------------------|----------|-----|
| B ₁ + | Xyl+ BM- | TL+ |

There should be a greater discrepancy between B₁- and B₁+, but this seems to place Xyl in the indicated position, between BM and B₁.

11 "Xyl+" tested on Mal. 10 were Mal+

1 Mal-

T(B₁) This establishes a linkage between Mal and Xyl.

Heterozygote var. var.

351
359

11/15/48

357 W45 x W477 n EMS Lac

359.. w145 x w466 " " 1/16.

359. - 27 + colonies from 10 plates. S.O. on bac EMB.

357 $\frac{38}{65} +$ colonies. 17 are Lac Var. (eq 40%)

| | | to EMS lac for test | Xyl EMB | Lac EMB | → | |
|------|----|-------------------------------|---------|---------|---------|-----|
| 357: | 1 | H-133 | + | ✓ | ○ | |
| | 2 | H-134 | ++ | ✓ | ⊗ | |
| | 3 | | ++ | — | ■ | |
| | 4 | | ++ | ✓ | ⊗ | |
| | 5 | | ++ | ✓ | ⊗ | |
| | 6 | | ++ | ✓ | ⊗ | |
| | 7 | | ++ | ✓ | ⊗ | |
| | 8 | | ++ | ✓ | ⊗ | |
| | 9 | | ++ | ✓ | ⊗ | |
| | 10 | H-135 | ++ | ✓ | ⊗ | |
| | 11 | | ++ | ✓ | ⊗ | |
| | 12 | | ++ | ✓ | + prod. | |
| | 13 | | ++ | ✓ | ○ | |
| | 14 | | ++ | ✓ | ○ | |
| | 15 | | ++ | ✓ | ○ | |
| | 16 | | ++ | ✓ | ○ | |
| | 17 | | ++ | ✓ | ○ | |
| | 18 | | ++ | ✓ | ○ | |
| | 19 | | ++ | ✓ | ○ | |
| | 20 | | ++ | ✓ | ○ | |
| | 21 | | ++ | ✓ | ○ | |
| | 22 | | ++ | ✓ | ○ | |
| | 23 | | ++ | ✓ | ○ | |
| | 24 | | ++ | ✓ | ○ | |
| | 25 | | ++ | ✓ | ○ | |
| | 26 | | ++ | ✓ | ○ | |
| | 27 | | ++ | ✓ | ○ | |
| | 28 | | ++ | ✓ | ○ | |
| | 29 | | ++ | ✓ | ○ | |
| | 30 | | ++ | ✓ | ○ | |
| | 31 | | ++ | ✓ | ○ | |
| | 32 | | ++ | ✓ | ○ | |
| | 33 | | ++ | ✓ | ○ | |
| | 34 | | ++ | ✓ | ○ | |
| | 35 | | ++ | ✓ | ○ | |
| | 36 | | ++ | ✓ | ○ | |
| | 37 | do 20 & 21 20 is ⊗ 21 is both | ++ | ? | type? | |
| | 38 | | ++ | ✓ | ○ | |
| | 39 | | ++ | ✓ | ○ | |
| 59. | 21 | 2 | Xyl | Lac | Glu | Mal |
| | 22 | 3 | ++ | ++ | ++ | ++ |
| | 23 | 5 | ++ | ++ | ++ | ++ |
| | 24 | 8 | ++ | ++ | ++ | ++ |
| | 25 | 9 | ++ | ++ | ++ | ++ |
| | 26 | 12 | ++ | ++ | ++ | ++ |
| | 27 | | ++ | ++ | ++ | ++ |
| | 28 | | ++ | ++ | ++ | ++ |
| | 29 | | ++ | ++ | ++ | ++ |
| | 30 | | ++ | ++ | ++ | ++ |
| | 31 | | ++ | ++ | ++ | ++ |
| | 32 | | ++ | ++ | ++ | ++ |
| | 33 | | ++ | ++ | ++ | ++ |
| | 34 | | ++ | ++ | ++ | ++ |
| | 35 | | ++ | ++ | ++ | ++ |
| | 36 | | ++ | ++ | ++ | ++ |
| | 37 | | ++ | ++ | ++ | ++ |
| | 38 | | ++ | ++ | ++ | ++ |
| | 39 | | ++ | ++ | ++ | ++ |

\oplus = sectorial variation

\odot = periclinal variegation.

\therefore either possibly 5 Lac + / Lac -
1. May none of these.

Chloroacetate papillation as a test for diplocy
Streptomyces resistance

380.

11/16/48.

Take single colonies from 356 a H. stokes to water and streak on T(0) ~~H~~ + Na chloroacetate 1mg/ml and streak out on EMB Lac. cf. K-12.

| | Stocks | Inoculant (v. 356a) | T(0a) | v | EMB Lac | T(0) |
|----|--------|---------------------|-------|----|---------|------|
| 1. | H-1 | 1 | | | | +++ |
| 2 | " | 2 | | v | | +++ |
| 3 | " | 3 | | v | | +++ |
| 4 | " | 4 | | v | | +++ |
| 5 | " | 5 | | v | | ++ |
| 6 | " | 6 | | ++ | | ++ |
| 7 | " | 7 | | ++ | | +++ |
| 8 | " | 8 | | v | | +++ |
| 9 | H52 | 4 | | v | | ++ |
| 10 | " | 2 | | - | | ++ |

K-12.

M17: No growth or papillation T(0a).

Plate W478 heavily on USA = 100u/ml Streptomyces.

11/16/48.

P17 - no colonies.

Note repeat Chloroacetate at various conc. / ml: in T(0).

| | 100 ukg | 200 u | 500 u | 1mg. | T(0). | EMB Lac. |
|----------|---------|-------|--------|--------------------------|-------|----------|
| K-12 | - pap | - | - | - | ++ | ++ |
| H-72-1 | - " | - | - | - | ++ | v |
| H-72-2 | - " | - | - | - | ++ | |
| Aerogum. | ++ | ++ | -, pap | gl. residual
removed. | ++ | |

Mannitol mutation test.

361

11/17/48.

73 plates \times 300/plate 21,000 tests.

W583, 7 sec. uv, Mannitol ETYB.

Quite a few slow, like 1.

| | | Mannitol | Sorbitol | Glucose | TT |
|------|-------------------------|----------|----------|---------|----|
| 1. | W583 slow. | - | - | + | S |
| 2. | W583 und-purification | + | - | + | S |
| 3. | - or slow? | - | - | + | S |
| 4. | - throw out. not cutans | - | - | - | ? |
| 5. | - | - | \pm | + | S |
| W594 | 6. | + | - | + | S |
| K | | + | + | | R. |

Repeat tests.

dark man

1
2
3
5
6

slow + slow +
slow + slow + ++
+ v.slow +

slow + -- W595.
+

V-retests.

~~367~~
SG3

Streak out, streaks, heavily on EMS Xyl.

H: 87. no cols.

88. 2-? colonies.

85, 86 4. col.

91 mostly -; ore. + cols.

92 ca 5+ cols.

93 no cols; 2 cols mentioned.

94

95 } no cols.

97. }

11/22/48. H88. both Xyl - Gal - no longer heterozygous for Xyl.

H91. Xyl +, - cols. [Restricted on Xyl EMS.] + and - cols.
Gal - but 2 kinds of colonies noted: "R" and "S" noted.

H92 Pure Xyl + on EMB.
Gal -

H93. Gal - Lac(s) - #3 is Xyl (V).

Streak out H93 for populations on Lac; Gal EMS.

→ Re-test on Xyl EMB, 8 cultures. All +. No heterozygote.

Gel-Revisions.

11/23/48.

Streak out MG3 on EMS Gal, Acet + Lac. and on EMB Xyl.
To look for reversion.

11/27. Papillae from Gal + Lac to same EMS. Acet turns + slowly, indicating selection.

4/19. Numerous lac+ colonies from papillae

 - 11/27. 1 2 3 4.

→ EMS lac + EMB lac.

All of are lac variegated! Configuration of lac - homogeneous.

Gel papillae on EMS Gal are not clear cut.

They have the form, however,  being + only in the center.

The diploids on lac EMS, enlarges more slowly, but have a comparable appearance.

4. Gel papillae taken to Date 11/23 EMS.

A ^{Gel EMB}
Mostly intact, strong ++.

^{Gel EMS}
All - Probably, segregated
++

B " + like EMB.
C Numerous colonies which have darkish centers and light margins. Not obviously variegated. ++.

D. like A. + like EMB. ++.

12/2. Streak out A B C + D from EMS to EMB (Gal and Xyl).
Also streak out D from EMB.

Xyl: A Var B Var C ++ D -. A + B are variegated.

Lac_2^+ - heterozygote

364.

11/19/48.

W45 x W588

20 Lac+ colonies picked

#17. for retest. This does segregate for Lac
and is presumably $\frac{\text{Lac}_2^+}{\text{Lac}_2^-}$.

H118. Predominantly +. Strains out on LacEMB. Maintained on EMBS
From mosaic A + B obtain - cols. and test mutation.

A¹ mg. B¹ MTL C¹ MTL W 606 607
A² ++ TO B² MTL C² M-
A³ ++. TO B³ MTL. C³ M-

Control on Bugal fermentation and selection of Lac-.

P28. inoculate slightly, 58-161 and Y10 each into 2 tubes of Bugal...
P29. Strains out on LacEMB. Bugal tube:

| | | | | | |
|---------|---|-------------|---|----|---------------------|
| 58-161- | 1 | about 20% - | A | +± | Some Lac slow? = D. |
| | 2 | all + | | ++ | E |
| | 1 | about 50% - | B | +± | |
| | 2 | about 1% - | C | ++ | W 602-5. |

P30. Purify one - from each culture.

Restreak all 4 cultures. P30.

A1.

58-161 1 as above.
"161 2
 $\sqrt{10}$ A 1 : 1 → +/-
 $\sqrt{10}$ B 2 100 : 1

Retest D and E on Bugal.

D: Bugal ++ Strains out on Lac
E: Bugal - rf. additional lac recovered

Sugillation from 4118 for lac_Z-~~T-L~~-L

36%

Streak out monasic colonies and test (1-3) Lac - from each.

12/2. 1. ++

12/3. A. MTL

B. MT

C1 MT

C2 ++

C3 MTL

D1 M? TL

D2 MT

D3 M

12/4. A1 M
A2 MT(B₁)
A3 M

B1 M
B2 M
B3 ++

C1 MTL
C2 MTL

D1 MTL
D2 MTL

12/5. A1 M
A2 M
A3 MT

B1 MTL
B2 M
B3 ++(B₁)

C1 MTL?
C2 MTL?
R

D1 M
D2 ++

12/12 Culture in T(TLB₁) liquid. streak out on EMS lac + TLB₁ and test single lac - colonies. All 10 were B₁ -.

Utilization of further substrates.

365

11/19/48.

1% x EMB.

A. KNa Tartrate

B. Propylene Glycol

C. Dextrose

D. Gum Arabic

E Sucrose

| | A | B | C | D | E |
|---------------|-----------|---|---|---|----|
| K-12 | -
gap. | - | - | - | - |
| Aerogunes | ± | - | - | - | ++ |
| S.typhimurium | | | | | |
| Malt+ | | | | | |
| " Malt- | | | | | |

11/21/48. Streaks out ~~paper~~ of K-12 on EMB Tartrate. Also S.O., 58-161 W583.

11/29/48. No evident ~~gas~~ acid production. Streaks out to EMB Ammonium H Tartrate, which may be more oxygenic.

11/21. Y87 on EM10 Sorbose. No obvious fermentation.
No mælzed inhibition

11/29 neg. flagellar
rotated. Reacts to
EM10 Sorbose.

Life cycle mutants of E. coli:

365

1/24/48....

- P23. Incubate 10 ml washed suspensions of Y87 and W126 in H₂O,
A) 10 secs. in open test tube. Incubate 1 ml/10 Y2 broth for crossing.
B) for control, Y87 × W126. (see 367).

A24. Lysis

10 plates × ca 200 photographs/plate. N26., # Lac + secs.
Shows out on Lac EM4B and ~~Lac~~ EM4S. 1 from B. 25.

EM4B

1. Lac +

Lac ++

2. missing, 1st test.

3. variegated or incomplete +



4. " " " , maybe mostly very rough



5. " " " "



See 371

"/24/48.

P26 bivalve, as 365, 5 secs. in sandish. Granulate
1 ml 1/10 Y2 for cross.

Cross "25.

P27: ~~Very~~ heavy yield, ca 100/plate. V. few + 10 plates
♀ lac+. S.O. bac EMBS + ~~lac~~ ~~microsporangio~~ bac EMS

bac EMBS.

① Mostly -; occ. + probably var.
2 bac ++

③ ~~④~~
mostly -

⑤ ~~⑥~~
bac ++

7 bac ++

8 bac ++

9. Mostly bac -; + may be var.

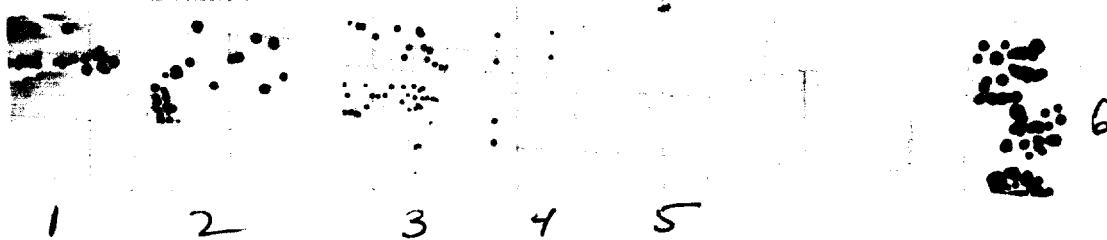
Restrains from bac EMS.

See 371

11/24/48.

Cross 487 x W126 on a variety of EMS media - variable supply of NH_4SO_4 sulfate.

| A.S.
g/liter. | K-H ₂ O content. | R ₁ . | Acid. | |
|-------------------|-----------------------------|------------------|-------|--|
| 5.0 | 1. = A | ++ | ++ | 8 plates, ca 300+ each. 4+ 11/26. |
| 1.0 | 2. B | ++ | ++ | 5 plates ca 90 ea. 1?+ |
| 0.1 | 3. C | ± | + | 5 plates ca 10 ea. No + |
| 0.05 | 4. D | + | ± | ditto |
| 0.01 | 5. E | ± | - | |
| 5+
5% glycerol | 6. F | +++ | + | Glycerol addition seems to inhibit acid production |



Yields are very much lower on "2" than on "1" suggesting a dependence on ammonium concentration.

367A: 4+.

- 1. ++
- 2. +/-? and -
- 3. +F
- 4. ++

B. 1. +.

S.O. on EMS Lac and nitost

See 37!

-6.

P27. All colonies read + (Glyceral +).

-2]. 1+ picked for test /5 plate.

See 37!

-3. Very low yield. Colonies appear very rough + dry.
1+ formed + picked for test.

-4. Ditto No +.

-5. Very tiny prototrophs, few in number. Not scoreable

11/25/48.

W-595 (lac, Mal, Xyl, Gal, Ar, Than-) × 58-161 m
 EMS ± B₁ (Xyl v Mal).

Mal B₁, plates have too heavy a background to enumerate
 Mal +

Xyl(0) yield very low - only a few + colonies.

Mal(0) somewhat heavy background.

Xyl(B₁) colonies v. small but more numerous; occ +.

Incubate Xyl(0) further.

| | + | - | Σ | 369 data |
|----------------------|----|---|----------|----------|
| Mal(0). | 4 | | 32 | |
| | 1 | | 43 | |
| | 6 | | 85 | |
| | 4 | | 57 | |
| | 4 | | 88 | |
| | 10 | | 130 | |
| | 2 | | 37 | |
| | 31 | | 552 | |
| Xyl(B ₁) | 2 | | 30 | |
| | 3 | | 42 | |
| | 2 | | 48 | |
| | 3 | | 42 | |
| | 3 | | 89 | |
| | 0 | | 28 | |
| | 4 | | 94 | |
| | 4 | | 68 | |
| | 21 | | 441 | |

11/24/48.

50-161, etc. Fructose EMB. 67 plates \times ca 300 = 20,000 tests
(plates are not properly gelled, but can be streaked).

| | | Lac | Max | ZnL | Gal |
|-----------------------------------|------|-----|-----|-----|-----|
| #2. <u>very slow</u> on fructose. | W596 | ++ | ++ | ++ | ++ |
| 5 - , sm. cols. | 597 | - | - | - | - |
| 7 - , sm. cols. | 598. | - | - | - | - |

Check on lactose, glucose

W596 (~~may show different fructose sensitivity~~)

W596 is also slightly slower than type on mannose.

fast on mannitol + sorbitol:

| | | |
|------|---|----|
| W596 | M | S. |
|------|---|----|

4/30 streaked W108 on Mannose, fructose EMB.

11/29/48.

Test Xyl^+ for Mal^+ in L45 Xyl Xyl^+ " Xyl^B , " Mal^B .a) $\text{Mal}^+ :$ 16 Xyl^+
(a) 15 ~~Xyl^-~~ b) $\text{Xyl}^+ :$ 4 Mal^+
(B,) 14 Mal^- .Strains out Mal^+ on Mal EMS; Xyl^+ , Xyl^- EMS for instances of heterozygosis1-16 a Xyl^+ } Mal^+
17-29 a ~~Xyl^-~~ } Mal^- 30-33 b Mal^+ } Xyl^+ .
34-47 b Mal^- } Xyl^- .1-3, 5-8, 9-12, 17-20, 21-24, 25-28
29-32 Intact $\text{Mal}^+ :$
29, 31-32, 33, 41, 42, 46, (2), ~~Mal^+~~ Xyl^+ .
 ~~Xyl^-~~ : 30, 34, 35, 36, 37-40, 43, 44

#4

Many Xyl^+ Mal^- were misclassified and should be Xyl^-
which, realters ratios!

✓ #4 was ped. Mal^- with some peculiar $\text{Mal}^+(\text{slow})$. Strains out
on Mal EMS. Mal^+ and Mal^- each pure. No signs of segregation.
What are slows? not clear. May have been Malt

365-366-367.

New heterozygotes.

1/28/48

Summary of apparent heterozygotes from cross of Y87 x W126.

~~365~~ H-

check from EMS.

| | | | |
|---------|-------|--|---|
| 1. 119 | 365-2 | lac ⁻ m ⁻ p ⁻ | Variety. |
| 2. 120 | 365-3 | lac ⁺ / - | Variety. |
| 3. 121 | 365-4 | +/- | Variety. |
| 4. 122 | 365-5 | +/- | Variety. |
| 5. 123 | 366-1 | +/-? Prod. -; Repurify | — |
| 6. 124 | 366-3 | +/- | Variety. (rel. stable). |
| 7. 125 | 366-5 | +/- | Variety. |
| 8. 126 | 366-9 | mostly - | Same + may be Var. Mostly - on EMS. purify "1/29: |
| 9. 127 | 365-6 | as EMS only | Variety. (rel. stable) |
| 10. 128 | 367-2 | " | Variety. |
| 11. 129 | "A1" | +/- | Variety. |
| 12. 130 | "A2" | mostly -; +/-? | Variety. |
| 13. 131 | -B | lac ⁺ / - | Variety. |
| 14. 132 | -C. | +/- | Variety. |

Obtain & characterize segregants from various of these.

| | | | |
|--|---------------------------------|---|-----|
| 1. H120B : lac ⁻ ✓ | M- ✓ | W | 599 |
| 2. H120A: lac ⁺ ✓ | T ^B - ✓ | W | 600 |
| 3. H119A: lac ⁻ | T ^L _B - ✓ | W | 601 |

November 30, 1948.

- A. W595 x W65. }
 B. W595 x W48 } Lac E 45
 C. W595 x W182 }
 (D) W595 x 58-161 } Mal Xyl E 45 ± B₁
 } Plated
- No prototrophs P2.
 A3. A - no prototrophs
 B+C Very few, uncountable + or -.
 Pick 12 from B and 8 from C for further
 test - 12/3 in E 45 Lac.
 all Lac -

| D: | Mal EMS | Mal B ₁ | Xyl | Xyl B ₁ | Man | Man B ₁ |
|--------|---------|--------------------|------|-----------------------|--------|--------------------|
| + | - | + | + | + | - | - |
| 2 | 16 | 1 | 84 | 12 | 109 | 0 |
| 0 | 7 | 3 | 169 | 3? | 18 | 0 |
| 7 | 31 | 6 | 210 | 5 | 28 | 0 |
| 2 | 34 | | | 0? | 26 | 0 |
| 0 | 1 | | | 0 | 54 | 1 |
| 0 | 7 | | | 3 | 54 | 0 |
| 0 | 9 | | | 3 | 36 | 1 |
| 0 | 13 | | | 0 | 0 | 0 |
| | | | 0 4 | 2 14 | 0 | 3 0 |
| | | | | | 0 | +1 |
| 12. | 11 8 | 10 | 46 3 | 0; 4 | 28 285 | 0 57 6 24 2 |
| 9.2% + | 3.2% + | 0 | 9% | (counted
to ca 1%) | 0 | 1.7% |

Picks +'s to homologous medium.

1-6 are Man B₁,
 7-10 are Man (0)
 see 372-9.

Mal B₁ plates turbid; Xyl plates empty!
 most difficult to score

Results: all Mal correctly scored
 All Man "

Most app. "Xyl +" are Xyl -

Recount certain plates:

| (HBL) Mannitol EMS. | | Mal EMS. | | X-gly EMSB, | |
|---------------------|----|----------|----|-------------|-----|
| + | - | + | - | + | - |
| 0 | 7 | 3 | 15 | 2 | 129 |
| 2 | 14 | 4 | 6 | 0 | 62 |
| 0 | 4 | 1 | 0 | | |
| 1 | 5 | | | | |
| 6 | 1 | | | | |
| 0 | 4 | | | | |
| | | 8 | 21 | 2 | 191 |
| <hr/> | | | | | |
| 4 | 35 | | | | |

ca. 1%

This late appearance of mannitol+ recalls interaction of glycerol+ and B, - noted in 1946.

Rich to analogous EMS and S.O. on EMBS.

Mal (O)+ 16 tested:
in EMBS. #1 pred.-, occasional +
others are ++.

HBL (O) 10+ tested on All +:
HBL EMS

December 1, 1948.

Struck out Y87 and W126 for single colonies to repeat 371.
Use microscoes and keys for record on EMB lac plate.

A. Y87A x W126 A. } 8 plates each.
etc.; B, C, D.

E. W599 x W588 i.e. H'? x H. Wrong stocks used. had in mind that
588 was a Lac+ reversion of 583.

F. W601 x W352 (Lac+ Xyl-).

~~G. W600~~ x Y87.

12/3: Yields variable; Lac - very small. Ca 100-200 / plate.

| | | |
|---|---------------------------|----------------------------|
| A. 7+ | Var. ⁽⁺⁺⁾ 6 ++ | |
| B. 1+ (-yields low) | 1++ | Should be separated. |
| C. 6+ | 4 Var 2++ (#3, #5) | |
| D. 8+ | 6 Var 2++ (#1, #7) | |
| E. Numerous ++. High yield + in excess. | 11 Var. 11 ++. | Equal numbers of Var + ++. |
| F. No yield. Good plates; sharp definition + no background. | | |

G. Small Lac+ colonies.

E: 28 streaked out on EMB lac 6 are Lac variable: #5, 13, 14, 8? + others

G. 60 " " " " . # 34, 37, 38 streaks on Lac EMS.
All others ++.

34+37 all - . 38: ++

New heterozygotes

374a

December 3, 1948.

A. W65 x W595 on Lac EMS.
Lac_x x Lac₋

No yield. 12/6

12/2/48.

70 plates W596 (58-111, Fuc ±) mediated 7 seconds EMBSda.
ca 300 /plate → 20,000 tests.

Numerous mucoid and slow colonies interfused with sampling:
Following finely screened.

| | Gluc | Lac | W |
|----|----------|--------|-------|
| 1 | — | — | |
| 2 | — | — | 610 |
| 3 | — | - pap | 611 |
| 4 | slow ++ | + | W612 |
| 5 | " | + | |
| 6 | " | ++ | |
| 7 | " | ++ | |
| 8 | " | + | |
| 9 | " | ++ | |
| 10 | " | ++ | 614 |
| 11 | → r. | - thin | |
| 12 | ++ and - | ++ | - 613 |
| 13 | slow + | ± | |

Save 1, 2, 3 fructose and reapply 12.
Do not keep slow mutants except 10